

R-9636HC 96" (2,440 mm) Hollow-Core Retaining Blocks

The Redi-Rock 96" (2,440 mm) XL retaining wall blocks are machine-placed, wet-cast, precast modular block units manufactured from first-purpose, non-reconstituted concrete and intended for use in the construction of dry-stacked modular retaining wall systems. The block units are manufactured from structural-grade concrete mixes in accordance with ASTM C94 or ASTM C685 that produce a finished unit with excellent resistance to freeze-thaw, deicing chemical exposure, and submerged conditions in both fresh water and salt water applications. All Redi-Rock retaining wall products are manufactured and distributed through an international network of individually-owned, licensed precast concrete manufacturers.

DIMENSIONAL PROPERTIES

DIMENSIONS ⁽¹⁾	
HEIGHT (FRONT OF BLOCK)	36 ± 3/16 (914 ± 5)
HEIGHT (BACK OF BLOCK)	36 ± 3/16 (914 ± 5)
LENGTH (FRONT OF BLOCK)	46 1/8 ± 1/2 (1172 ± 13)
LENGTH (BACK OF BLOCK)	21 5/8 ± 1/2 (549 ± 13)
WIDTH	90 5/8 ± 1/2 (2302 ± 13) FORM LINE TO BACK OF BLOCK AND 5 3/8 (136) ± FACE TEXTURE
CONCRETE VOLUME	
LEDGESTONE FACE	33.83 ft ³ (0.958 m ³)±
SHIPPING/HANDLING WEIGHT ⁽²⁾	
LEDGESTONE FACE	4840 lb (2190 kg)±

⁽¹⁾ All dimensions are *inches (mm)*.

⁽²⁾ Weight shown is based on an assumed concrete unit weight of 143 lb/ft³ (2291 kg/m³). Actual weights will vary.

CONCRETE MIX PROPERTIES ⁽³⁾

FREEZE THAW EXPOSURE CLASS ⁽⁴⁾	MINIMUM 28 DAY COMPRESSIVE STRENGTH ⁽⁵⁾	MAXIMUM WATER CEMENT RATIO	NOMINAL MAXIMUM AGGREGATE SIZE	AGGREGATE CLASS DESIGNATION ⁽⁶⁾	AIR CONTENT ⁽⁷⁾
MODERATE	4,000 psi (27.6 MPa)	0.45	1 inch (25 mm)	3M	4.5% ± 1.5%
SEVERE	4,000 psi (27.6 MPa)	0.45	1 inch (25 mm)	3S	6.0% ± 1.5%
VERY SEVERE	4,500 psi (30.0 MPa)	0.40	1 inch (25 mm)	4S	6.0% ± 1.5%
MAXIMUM WATER-SOLUBLE CHLORIDE ION (Cl ⁻) CONTENT IN CONCRETE, PERCENT BY WEIGHT OF CEMENT ^(8,9)					0.15
MAXIMUM CHLORIDE AS Cl ⁻ CONCENTRATION IN MIXING WATER, PARTS PER MILLION					1000
MAXIMUM PERCENTAGE OF TOTAL CEMENTITIOUS MATERIALS BY WEIGHT ^(10,12) (VERY SEVERE EXPOSURE CLASS ONLY)					
FLY ASH OR OTHER POZZOLANS CONFORMING TO ASTM C618					25
SLAG CONFORMING TO ASTM C989					50
SILICA FUME CONFORMING TO ASTM C1240					10
TOTAL OF FLY ASH OR OTHER POZZOLANS, SLAG, AND SILICA FUME ⁽¹¹⁾					50
TOTAL OF FLY ASH OR OTHER POZZOLANS AND SILICA FUME ⁽¹¹⁾					35
ALKALI-AGGREGATE REACTIVITY MITIGATION per ACI 201					

⁽³⁾ Concrete mix properties are in general accordance with ACI 318 durability requirements. Research has shown that concrete manufactured to these standards demonstrates good durability and performance. When these requirements are followed, specific freeze-thaw testing of the concrete is typically NOT required.

⁽⁴⁾ Exposure class is as described in ACI 318. "MODERATE" describes concrete that is exposed to freezing and thawing cycles and occasional exposure to moisture. "SEVERE" describes concrete that is exposed to freezing and thawing cycles and in continuous contact with moisture. "VERY SEVERE" describes concrete that is exposed to freezing and thawing cycles and in continuous contact with moisture and exposed to deicing chemicals. Exposure class should be specified by owner/purchaser prior to ordering placement. Longer lead times may be required for block units manufactured for "severe" and "very severe" exposure classes.

⁽⁵⁾ Test method ASTM C39.

⁽⁶⁾ Defined in ASTM C33 Table 3 *Limits for Deleterious Substances and Physical Property Requirements of Coarse Aggregate for Concrete*.

⁽⁷⁾ Test method ASTM C231.

⁽⁸⁾ Test method ASTM C1218 at age between 28 and 42 days.

⁽⁹⁾ Where used in high sulfate environments or where alkali-silica reactivity is an issue, water soluble chloride shall be limited to no more than trace amounts (from impurities in concrete-making components, not intended constituents.)

⁽¹⁰⁾ The total cementitious material also includes ASTM C150, C595, C845, and C1157 cement. The maximum percentages shall include:

- (a) Fly ash or other pozzolans in type IP, blended cement, ASTM C595, or ASTM C1157.
- (b) Slag used in the manufacture of an IS blended cement, ASTM C595, or ASTM C1157.
- (c) Silica fume, ASTM C1240, present in a blended cement.

⁽¹¹⁾ Fly ash or other pozzolans and silica fume shall constitute no more than 25 and 10 percent, respectively, of the total weight of the cementitious materials.

⁽¹²⁾ Prescriptive limits shown may be waived for concrete mixes that demonstrate excellent freeze/thaw durability in a detailed and current testing program.

R-9636HC 96" (2,440 mm) Hollow-Core Retaining Blocks

DESIGN PROPERTIES

HORIZONTAL SETBACK / WALL FACE BATTER	BLOCK TO BLOCK INTERFACE SHEAR ⁽¹³⁾	
		$S_{p(1)} = 4547 \text{ lb/ft} + N \tan 44^\circ$ (66.4 kN/m + $N \tan 44^\circ$)
3¼ inches (83 mm) PER COURSE	$S_{p(2)} = 8488 \text{ lb/ft} + N \tan 22^\circ$ (123.9 kN/m + $N \tan 22^\circ$)	for $7017 \leq N < 16,118 \text{ lb/ft}$ ($102.4 \leq N < 235.2 \text{ kN/m}$)
(5.2° BATTER)	$S_{p(\text{max})} = 15,000 \text{ lb/ft}$ (218.9 kN/m)	for $N \geq 16,118 \text{ lb/ft}$ ($N \geq 235.2 \text{ kN/m}$)
INFILLED UNIT WEIGHT FOR WALL STABILITY CALCULATIONS ⁽¹⁴⁾		
LEDGESTONE FACE	112 lb/ft ³ (1801 kN/m ³)	
MINIMUM CONSTRUCTION RADIUS ⁽¹⁵⁾		
CONCAVE CURVE	14 ft - 6 in (4.42 m)	
CONVEX CURVE	14 ft - 6 in (4.42 m)	

⁽¹³⁾ Values based on full scale testing performed in 2017 and 2018. Copies of the full test reports are available at www.redi-rock.com.

⁽¹⁴⁾ The infilled unit weights shown here are based on an assumed concrete unit weight of 143 lb/ft³ (2291 kg/m³) and an assumed soil unit weight of 100 lb/ft³ (1602 kN/m³). They are reference values. Several factors can cause the unit weights of both concrete and infill soil to vary. The designer should use sound engineering judgement when assigning an infilled unit weight value for analysis.

⁽¹⁵⁾ The minimum construction radius stated is applicable to both concave and convex curved retaining wall sections. Increases to this minimum radius are required to account for wall batter. Special consideration should be given to block selection, facing batter, and wall height when selecting the minimum radius for the final wall alignment.

